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## (54) POCKET INHALER

(71) We, Fisons Limited, a British Company, of Fison House, 9 Grosvenor Street, London, W1X 0AH, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns improvements in or relating to devices for the inhalation of medicaments.

A number of devices are known which enable medicaments in powder form to be inhaled orally by a patient, examples of such devices being described for example in UK Patent Specification No. 1,122,284 and Belgian Patent Specifications Nos 851238 and 851241. Many inhalation devices, including all of those of the above specifications, are adapted to administer the medicament from a container, e.g. capsule, in which it is initially contained, the container being placed in a chamber in the device wherein it is pierced or cut and then subjected on inhalation through the device to a vibrator/rotatory motion by the inhaled air stream. This motion expels the powder from the container and causes it to be entrained in the air stream, thereby enabling its inhalation by the patient.

To enable the container to be placed in the chamber of the device there is usually provided a mouthpiece portion of the device which may be unscrewed or otherwise simply detached, and which is replaced prior to inhalation once the container has been inserted into the chamber. Such detachable portions are generally small and difficult to handle, and may moreover become detached whilst the patient is inhaling through the device with possible serious consequences due to the detached portion becoming lodged in the airways of the patient.

We have now found an inexpensive yet reliable way of reducing the occurrence of detachment of such portions in use and preventing the irretrievable lodging of such portions in the patient's airways if they do become detached in use.

Accordingly, in one aspect, this invention provides a device for the oral inhalation of a

medicament in powder form wherein the medicament is dispersed from a container into an inhaled air stream solely upon inhalation through said device, which device comprises a body portion having a chamber wherein the medicament may be dispersed into the inhaled air stream, access to the chamber for the insertion of a container of medicament being provided by a detachable mouthpiece having at least one flange portion extending outwardly at a point from 1 cm to 5 cm from the free end of said mouthpiece for a distance of from 10 to 100% of the diameter of the mouthpiece at the point from which it extends.

The flange portion or portions serve three important functions. Firstly, because they project from the mouthpiece, they enable the patient to obtain greater purchase when attaching the mouthpiece to the body portion prior to inhalation therethrough. This, especially where, as preferred, the mouthpiece is attachable by a screw thread to the body portion, decreases the risk of the mouthpiece becoming detached in use. Secondly, they provide the patient with a tactile indication of when the mouthpiece has been inserted correctly into the mouth, and provide some barrier to the passage of the mouthpiece past the lips or teeth of the patient if it does become detached. Thirdly if the mouthpiece does become detached in use, they decrease the risk of it becoming irretrievably lodged in the patient's airways. This latter function is very important in devices where it is the inhalation by the patient which causes the device to operate since it is in such devices that the risk of inhalation of the mouthpiece is greatest.

The flange portion desirably extends continuously around the mouthpiece since this construction gives maximum prevention of penetration into the mouth or airways of the patient regardless of the orientation of the mouthpiece. It may thus be annular or whatever other shape is dictated by the cross-section of the mouthpiece at the point from which the flange extends. However, if desired, one or more discrete flange portions may be provided, in which case it is preferred for 100

there to be as high a number as possible. The or each flange portion may extend in a plane normal to the axis of the mouthpiece or may extend at an angle to the axis of the mouthpiece, e.g. to form a continuous conical flange.

The or each flange portion desirably extends from the mouthpiece at a point from 1cm to 3cm from the free end thereof. Conveniently, the or each flange portion extends outwardly for a distance of from 15 to 40% of the diameter of the mouthpiece at the point at which it extends. Where diametrically opposed flange portions or a continuous flange portion is employed the diameter of the mouthpiece will thus be effectively increased by from 30 to 80%.

The invention will now be described, though only by way of illustration, with reference to the accompanying drawings, in which:

Figure 1 is a cross-sectional view through a mouthpiece of an inhaler constructed in accordance with the invention; and

Figure 2 is a plan view in the direction of arrow A of the mouthpiece of Figure 1.

The mouthpiece 1 shown in Figures 1 and 2 is suitable for attachment to a body 2 (shown dotted) of an inhaler as illustrated in Figure 2 of UK Patent Specification No. 1,122,284. The free end 3 of the mouthpiece is adapted to be inserted into the mouth of the patient and, in use, air is sucked through passageways (not shown) in the mouthpiece from the body 2. A pin 4 is provided on the mouthpiece 1, on which in use is mounted a propeller member into which is fitted a pierced capsule of a powdered medicament. On inhaling through the mouthpiece the capsule is subjected to a vibratory and rotatory motion as described in UK Patent Specification No. 1,122,284 to disperse the medicament into the airstream. At a distance of about 2.5cm from the end 3 of the mouthpiece 1 is provided a continuous annular flange 5 which extends around the circumference of the mouthpiece normal to the axis thereof, and extends outwardly therefrom. The flange increases the diameter of the mouthpiece by some 85%. In use, the mouthpiece is inserted into the mouth up to the flange, which abuts the lips. The flange is of such a size that insertion thereof into the mouth is rendered difficult and uncomfortable. If the mouthpiece is taken into

the mouth complete with flange, however, and becomes detached in the mouth, the bulk and shape of the mouthpiece with the flange prevents it from becoming lodged in the patient's airways.

#### WHAT WE CLAIM IS:—

1. A device for the oral inhalation of a medicament in powder form wherein the medicament is dispersed from a container into an inhaled air stream solely upon inhalation through said device, which device comprises a body portion having a chamber wherein the medicament may be dispersed into the inhaled air stream, access to the chamber for the insertion of a container of medicament being provided by a detachable mouthpiece having at least one flange portion extending outwardly at a point from 1 cm to 5 cm from the free end of said mouthpiece for a distance of from 10 to 100% of the diameter of the mouthpiece at the point from which it extends.
2. A device according to claim 1 wherein the mouthpiece is detachable from the body portion by means of a screw thread.
3. A device according to claim 1 or claim 2 wherein the flange portion extends continuously around the mouthpiece.
4. A device according to any of claims 1 to 3 wherein the or each flange portion extends in a plane normal to the axis of the mouthpiece.
5. A device according to any of claims 1 to 4 wherein the or each flange portion extends from the mouthpiece at a point from 1 cm to 3 cm from the free end of the mouthpiece.
6. A device according to any of claims 1 to 5 wherein the or each flange portion extends outwardly for a distance of from 15 to 40% of the diameter of the mouthpiece at the point at which it extends.
7. A device according to any of claims 1 to 6 and substantially as described herein with reference to the accompanying drawings.

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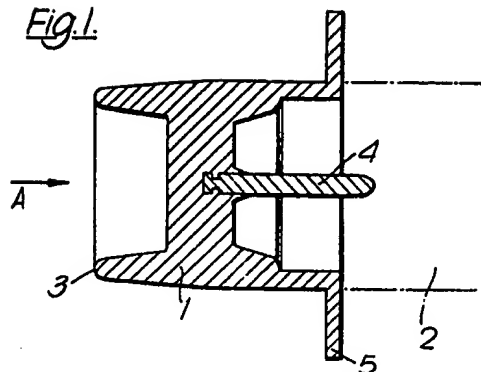
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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

*Fig.1*



*Fig.2*

